

CLAIMS

1. An in vivo video camera system comprising:

a swallowable capsule comprising:

5 a camera system;

an optical system for imaging an area of interest onto said camera system; and

a transmitter which transmits the video output of said camera system; and

10 a reception system which receives said transmitted video output.

~~4.~~
~~2.~~

A system according to claim 1 and wherein said reception system comprises:

15 an antenna array capable of surrounding a body and comprising a plurality of antennas for receiving said transmitted video output and for producing a plurality of received signals; and

a demodulator capable of transforming said plurality of received video signals into a single video datastream.

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~~5.~~
~~3.~~

A system according to claim ~~2~~⁴ and also comprising a data processing system which generates tracking and video data from said single datastream.

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~~2.~~
~~4.~~

A system according to claim 1 and including means for operating said transmitter intermittently.

~~3.~~
~~6.~~

30 A system according to claim 1 and wherein said optical system includes a viewing window located along one side of said swallowable capsule.

~~10.~~
~~8.~~

A reception system operable with a swallowable transmitting capsule, the reception system comprising:

35 an antenna array capable of surrounding a body and comprising a plurality of antennas for receiving transmitted video

output from said capsule and for producing a plurality of received video signals; and

a demodulator capable of transforming said plurality of received video signals into a single video datastream.

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~~11.~~
~~7.~~

An autonomous video endoscope comprising:

a swallowable capsule comprising:

a camera system;

an optical system for imaging an area of interest onto

10 said camera system; and

a transmitter which transmits the video output of said camera system; and

a reception system which receives said transmitted video output.

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~~12.~~
~~8.~~

A system according to claim ~~7~~¹¹ and wherein said reception system comprises:

an antenna array capable of surrounding a body and comprising a plurality of antennas for receiving said transmitted
20 video output and for producing a plurality of received signals; and

a demodulator capable of transforming said plurality of received video signals into a single datastream.

~~13.~~
~~9.~~

A system according to claim ~~8~~¹² and also comprising a data
25 processing system which generates tracking and video data from said single datastream.

~~6.~~
~~10.~~

A system according to claim 1 and wherein said optical system comprises:

30 an axicon optical element having a conical outer surface which, when said conical outer surface is in contact with inner walls of a flexible tube, creates a conical object on said conical outer surface, for compensating for the conical shape of said conical object; and

35 a relay unit which relays said compensated object to said

camara system.

~~7.~~
~~11.~~ A system according to claim ~~10~~⁶ and wherein said axicon optical element has an axis of symmetry and a borehole centered
5 around said axis of symmetry.

~~8.~~
~~12.~~ A system according to claim ~~10~~⁶ and also comprising a light source located within said borehole of said axicon optical element.

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~~9.~~
~~13.~~ A system according to claim ~~10~~⁶ and wherein said axicon element is located before said relay unit and said camera system thereby to enter said flexible tube first and to open up said flexible tube if it has collapsed.

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14. A system according to claim ~~10~~¹¹ and wherein said optical system comprises:

an axicon optical element having a conical outer surface which, when said conical outer surface is in contact with inner
20 walls of a flexible tube, creates a conical object on said conical outer surface, for compensating for the conical shape of said conical object; and

a relay unit which relays said compensated object to said camara system.

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15. A system according to claim 14 and wherein said axicon optical element has an axis of symmetry and a borehole centered around said axis of symmetry.

30 16. A system according to claim 14 and also comprising a light source located within said borehole of said axicon optical element.

17. A system according to claim 14 and wherein said axicon
35 element is located before said relay unit and said camera system

thereby to enter said flexible tube first and to open up said flexible tube if it has collapsed.